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# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MARUJUN JUKO KK

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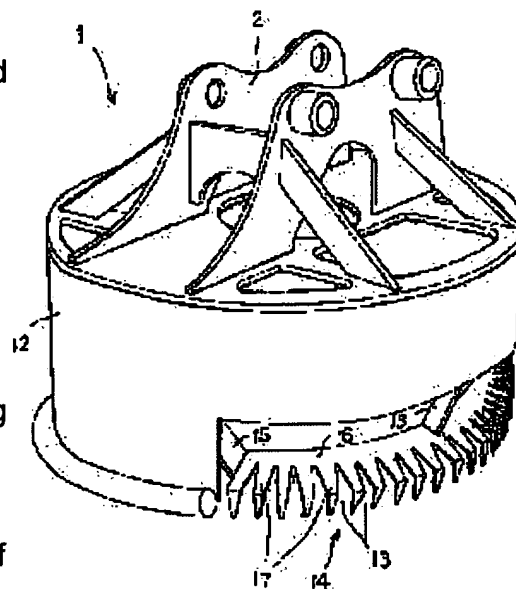
(72)Inventor : OGAWA JUNJI

## (54) WEED AND TREE TRIMMER

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a trimmer capable of traveling in a traverse direction to grip and trim weeds and trees, and inhibiting the scattering of dangerous objects with its rotary blade.

**SOLUTION:** This weed and tree trimmer is equipped with a power-driven rotary blade unit and an outer cylindrical cover for covering an outer periphery of the blade rotation orbit of the blade unit, wherein the skirt of the cylindrical cover is partially or totally fabricated with a comb-like member having notches for receiving and gripping the weeds and trees. The comb-like member preferably comprises a comb-shaped guard which has comb teeth extending from an upper part of the rotary blade to the periphery in the radial direction of the rotary blade and bending downward at their top ends, and which is formed to have notches extending from the periphery to the center in the radial direction between the comb teeth. The comb-like member further preferably comprises another type of the comb-shaped guard which has notches vertically extending upward from bottom of the cylinder cover between the vertically arranged comb teeth. The comb-like member is furthermore preferably so formed as to protrude to the outside of the cylindrical cover.



## LEGAL STATUS

[Date of request for examination]

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CLAIMS

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[Claim(s)]

[Claim 1] Plants tree trimming equipment characterized by forming in a ctenidium member equipped with slitting of a large number which accept plants and support some or all of the perimeter of the lower part of said outer case covering in plants tree trimming equipment which prepared outer case covering for providing a rotary knife unit driven under power, and preventing scattering of the dangerous substance on an orbital periphery of an edge of a rotary knife unit [Claim 2] Plants tree trimming equipment according to claim 1 characterized by being the ctenidium guard in which slitting to which a ctenidium member has a ctenidium which turned a stretch tip side to a radial outside caudad, and was made crooked from the upper part of an edge of a rotary knife unit, and extends in the direction of the radius inside between ctenidiums was formed [Claim 3] Plants tree trimming equipment according to claim 1 characterized by being a ctenidium guard having slitting to which a ctenidium member extends towards the upper part from outer case covering margo inferior between ctenidiums of the vertical direction [Claim 4] Plants tree trimming equipment according to claim 1 characterized by making a ctenidium member jut out over an outside of outer case covering

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Application of the Invention] This invention relates to the plants tree trimming equipment which prepared the protective cover for preventing scattering of the dangerous substance in the perimeter of a rotation orbit of a rotary knife especially about the plants tree trimming equipment which uses a power rotary knife.

[0002]

[Problem(s) to be Solved by the Invention] Generally the power mowing equipment used for Yamano's undergrowth cutting etc. has fixed the grass cutting blade to anchoring and this axis of rotation for the axis of rotation which rotates under power, such as a hydraulic motor, on the frame connected with the arm of earthmoving machines, such as a hydraulic excavator.

[0003] In order that a mowing edge may carry out high-speed rotation, this kind of tree trimming equipment disperses bottles, cans, etc. including the mown piece of wood which have been thrown away into rock, earth and sand, or the ground around, and is very dangerous. the equipment which mows plants gradually from a tip as puts the orbital outside of a rotary knife from the upper part of a cover and plants with a cylinder-like guard in order to prevent this -- development -- now, it is.

[0004] Thus, the mowing machine of the format of mowing it sequentially from a top with outer case covering as the orbital outside of the rotary knife of a tree trimming machine is put from the upper part of a cover and plants can prevent the accident by scattering of a foreign matter, and although there is an advantage that plants can be ground finely, it cannot mow, making it move along the ground. Since it may be efficient to mow moving a tree trimming machine to a longitudinal direction along the ground in the place where the height of plants is low, this improvement was called for.

[0005] On the other hand, having un-arranged [ that grass cannot be felled and it cannot mow finely at the root by rotation of an edge ], since the tree trimming machine which has not prepared covering in the side did not have a thing supporting plants, although it could mow carrying out horizontal migration to a longitudinal direction.

[0006] Therefore, the purpose of this invention grasps and mows the root of plants in the case of horizontal migration, and is to offer further the plants tree trimming equipment which can prevent scattering of the dangerous substance by the rotary knife while it can mow plants, making it move along the ground.

[0007]

[Means for Solving the Problem] It is characterized by to form in a ctenidium member equipped with slitting of a large number which accept plants and support some or all of the perimeter of the lower part of said outer case covering in plants tree-trimming equipment which prepared outer case covering for this invention possessing a rotary knife unit driven under power, and preventing scattering of the dangerous substance on an orbital periphery of an edge of a rotary knife unit in order to attain the 1st purpose of the above.

[0008] Preferably, a ctenidium member has a ctenidium which turned a stretch tip side to a radial outside caudad, and was made to crook or curve from the upper part of an edge of a rotary knife unit, and constitutes it from a ctenidium guard in which slitting prolonged in the direction of the radius inside between ctenidiums was formed.

[0009] Moreover, a ctenidium member may consist of ctenidium guards having slitting prolonged towards the upper part from outer case covering margo inferior between ctenidiums of the vertical direction.

[0010] Furthermore, a ctenidium member may be made to jut out over an outside of outer case covering.

[0011]

[Embodiment of the Invention] Hereafter, it explains based on the drawing of attachment of the operation gestalt of this invention. The plants tree trimming equipment 1 of the example of drawing is used as an attachment of earthmoving-machine main parts, such as a power shovel, and the rotary knife unit 7 which rotates with the axis of rotation 5 and the rotation means of communication 6 of a driving gear, such as a hydraulic motor 4, on the frame 3 which fixed the stay 2 for connecting the arm and actuation link of an earthmoving-machine main part is formed.

[0012] Moreover, as the tree trimming equipment 1 of the example of drawing is shown in drawing 1 , while engaging the support case 8 with the axis of rotation 5 which rotates with a hydraulic motor 4 pivotable through a brake mechanism 9 Set the follower axis of rotation as the shaft 11 of two rotary knife units 7 which fixed two or more edges 10, and it is fixed to revolve free [ rotation ] to right and left of said support case 8. While making said axis of rotation 5 and shaft 11 of the rotary knife unit 7 coordinate with the rotation means of communication 6, such as a belt and a gear, rotating the shaft 11 of the rotary knife unit 7 by rotation of the axis of rotation 5 by this and mowing plants By the rotational resistance of the rotary knife unit 7, the support case 8 resists friction of a brake mechanism 9, and rotates, and the rotary knife unit 7 rotates \*\*\*\* of the axis of rotation 5. That is, the rotary knife unit 7 of the example of drawing is the common hydraulic motor 4, and it revolves around the sun to the axis of rotation 5, rotating at high speed.

[0013] Rock etc. scatters around and these tree trimming equipments are risk, when the perimeter of the side has opened wide, since the rotary knife unit 7 rotates at high speed. For this reason, the perimeter of the side is established for the wrap outer case covering 12 in the rotation orbital outside (the example of drawing revolution orbital outside of the rotary knife unit 7) around [ side / 10 ] tree trimming equipment 1 (i.e., the edge of the rotary knife unit 7), and it is made for debris to have not jumped out to the exterior of tree trimming equipment 1 in this outer case covering 12.

[0014] However, when the perimeter of the outer case covering 12 consists of tabular members, if it is going to mow moving tree trimming equipment 1 along the ground, the outer case covering 12 will become obstructive, or grass is felled with the outer case covering 12, and mowing becomes impossible. The tree trimming equipment 1 of this invention is constituted from a ctenidium member 14 in which the infeed 13 of a large number which accept plants for a part or all of the circumference of the margo inferior of the outer case covering 12 surrounding a side periphery was formed. Then, like drawing 1 While plants 20 incorporate inside the ctenidium member 14 through this infeed 13 and carry out horizontal migration of the tree trimming equipment 1 along the ground by this, it enables it to mow them between the ctenidiums of both sides, as plants 20 are held when horizontal migration of the tree trimming equipment 1 is carried out.

[0015]

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**TECHNICAL FIELD**

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[Application of the Invention] This invention relates to the plants tree trimming equipment which prepared the protective cover for preventing scattering of the dangerous substance in the perimeter of a rotation orbit of a rotary knife especially about the plants tree trimming equipment which uses a power rotary knife.

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**EFFECT OF THE INVENTION**

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[Effect] Since the tree trimming equipment of this invention mows them in this slitting intermittent section as plants are held, it can be finely cut down from a root, while being able to mow carrying out horizontal migration of the tree trimming equipment along the ground, since some or all of outer case covering consists of ctenidium members which have the slitting intermittent section.

[0025] Since the plants grasped by the infeed intermittent section of a ctenidium member become the wall of a lengthwise direction, scattering of the dangerous substance by the rotary knife is prevented.

[0026] By turning the comb blade of a comb blade member caudad, scattering prevention of the dangerous substance becomes much more certain.

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] Generally the power mowing equipment used for Yamano's undergrowth cutting etc. has fixed the grass cutting blade to anchoring and this axis of rotation for the axis of rotation which rotates under power, such as a hydraulic motor, on the frame connected with the arm of earthmoving machines, such as a hydraulic excavator.

[0003] In order that a mowing edge may carry out high-speed rotation, this kind of tree trimming equipment disperses bottles, cans, etc. including the mown piece of wood which have been thrown away into rock, earth and sand, or the ground around, and is very dangerous. the equipment which mows plants gradually from a tip as puts the orbital outside of a rotary knife from the upper part of a cover and plants with a cylinder-like guard in order to prevent this -- development -- now, it is.

[0004] Thus, the mowing machine of the format of mowing it sequentially from a top with outer case covering as the orbital outside of the rotary knife of a tree trimming machine is put from the upper part of a cover and plants can prevent the accident by scattering of a foreign matter, and although there is an advantage that plants can be ground finely, it cannot mow, making it move along the ground. Since it may be efficient to mow moving a tree trimming machine to a longitudinal direction along the ground in the place where the height of plants is low, this improvement was called for.

[0005] On the other hand, having un-arranged [ that grass cannot be felled and it cannot mow finely at the root by rotation of an edge ], since the tree trimming machine which has not prepared covering in the side did not have a thing supporting plants, although it could mow carrying out horizontal migration to a longitudinal direction.

[0006] Therefore, the purpose of this invention grasps and mows the root of plants in the case of horizontal migration, and is to offer further the plants tree trimming equipment which can prevent scattering of the dangerous substance by the rotary knife while it can mow plants, making it move along the ground.

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## MEANS

[Means for Solving the Problem] It is characterized by to form in a ctenidium member equipped with slitting of a large number which accept plants and support some or all of the perimeter of the lower part of said outer case covering in plants tree-trimming equipment which prepared outer case covering for this invention possessing a rotary knife unit driven under power, and preventing scattering of the dangerous substance on an orbital periphery of an edge of a rotary knife unit in order to attain the 1st purpose of the above.

[0008] Preferably, a ctenidium member has a ctenidium which turned a stretch tip side to a radial outside caudad, and was made to crook or curve from the upper part of an edge of a rotary knife unit, and constitutes it from a ctenidium guard in which slitting prolonged in the direction of the radius inside between ctenidiums was formed.

[0009] Moreover, a ctenidium member may consist of ctenidium guards having slitting prolonged towards the upper part from outer case covering margo inferior between ctenidiums of the vertical direction.

[0010] Furthermore, a ctenidium member may be made to jut out over an outside of outer case covering.

[0011]

[Embodiment of the Invention] Hereafter, it explains based on the drawing of attachment of the operation gestalt of this invention. The plants tree trimming equipment 1 of the example of drawing is used as an attachment of earthmoving-machine main parts, such as a power shovel, and the rotary knife unit 7 which rotates with the axis of rotation 5 and the rotation means of communication 6 of a driving gear, such as a hydraulic motor 4, on the frame 3 which fixed the stay 2 for connecting the arm and actuation link of an earthmoving-machine main part is formed.

[0012] Moreover, as the tree trimming equipment 1 of the example of drawing is shown in drawing 1, while engaging the support case 8 with the axis of rotation 5 which rotates with a hydraulic motor 4 pivotable through a brake mechanism 9 Set the follower axis of rotation as the shaft 11 of two rotary knife units 7 which fixed two or more edges 10, and it is fixed to revolve free [ rotation ] to right and left of said support case 8. While making said axis of rotation 5 and shaft 11 of the rotary knife unit 7 coordinate with the rotation means of communication 6, such as a belt and a gear, rotating the shaft 11 of the rotary knife unit 7 by rotation of the axis of rotation 5 by this and mowing plants By the rotational resistance of the rotary knife unit 7, the support case 8 resists friction of a brake mechanism 9, and rotates, and the rotary knife unit 7 rotates \*\*\*\* of the axis of rotation 5. That is, the rotary knife unit 7 of the example of drawing is the common hydraulic motor 4, and it revolves around the sun to the axis of rotation 5, rotating at high speed.

[0013] Rock etc. scatters around and these tree trimming equipments are risk, when the perimeter of the side has opened wide, since the rotary knife unit 7 rotates at high speed. For this reason, the perimeter of the side is established for the wrap outer case covering 12 in the rotation orbital outside (the example of drawing revolution orbital outside of the rotary knife unit 7) around [ side / 10 ] tree trimming equipment 1 (i.e., the edge of the rotary knife unit 7), and it is made for debris to have not jumped out to the exterior of tree trimming equipment 1 in this outer case covering 12.

[0014] However, when the perimeter of the outer case covering 12 consists of tabular members, if it is going to mow moving tree trimming equipment 1 along the ground, the outer case covering 12 will become obstructive, or grass is felled with the outer case covering 12, and mowing becomes impossible. The tree trimming equipment 1 of this invention is constituted from a ctenidium member 14 in which the infeed 13 of a large number which accept plants for a part or all of the circumference of the margo inferior of the outer

case covering 12 surrounding a side periphery was formed. Then, like drawing 1 While plants 20 incorporate inside the ctenidium member 14 through this infeed 13 and carry out horizontal migration of the tree trimming equipment 1 along the ground by this, it enables it to mow them between the ctenidiums of both sides, as plants 20 are held when horizontal migration of the tree trimming equipment 1 is carried out. [0015] From the attachment edge 16 combined with the frame 15 inside the outer case covering 12, it inclines in the direction of a radius outside, extends, and has the ctenidium 17 of a large number which the tip side was turned [ a large number ] to bottom \*\* and incurvated it, the infeed 13 prolonged from the margo inferior to the attachment edge 16 between a ctenidium 17 and 17 is formed, and drawing 1 and the ctenidium member 14 of the example of drawing 2 constitute the protection guard for whom a ctenidium 17 prevents scattering of the dangerous substance.

[0016] Therefore, the infeed 13 of the ctenidium member 14 of this example has entered to the inside of the side of the ctenidium member 14. For this reason, if horizontal migration of the tree trimming equipment 1 is carried out along the ground, plants will enter into the inside of the ctenidium member 14, i.e., the interior of tree trimming equipment 1, standing with this infeed 13, and after having been grasped by said bottom \*\*\*\*\* of the ctenidium 17 of both sides, they will be mown by the rotary knife unit 7.

[0017] The ctenidium member 14 of the drawing 3 example has composition which formed intermittently the infeed 13 of a large number prolonged in the upper part from the lower limit of this plate surface in the plate surface which has an attachment piece along with the longitudinal direction of a plate surface, and formed the ctenidium 17 between infeed 13 and 13. If horizontal migration of the tree trimming equipment 1 is carried out along the ground by this configuration, the amount of [ of plants ] root Motobe will enter inside the ctenidium member 14 through infeed 13. Since this infeed 13 is prolonged perpendicularly upwards, plants are felled at the deepest edge of infeed 13, but since this infeed 13 holds proper length, root Motobe of plants gets down from close inside the ctenidium member 14, and it is cut down by the rotary knife unit 7 in the condition of having supported to the ctenidium 17 of the both sides of infeed 13.

[0018] The ctenidium member 14 of the drawing 4 example combines with said horizontal reinforcing rib 18 the reinforcing rib 19 fixed to the outside longitudinal direction of each ctenidium 17, and is raising reinforcement while it forms the horizontal reinforcement plate 18 in the hoop direction of said ctenidium member 14 of said drawing 3 at one.

[0019] Turn the ctenidium member 14 to the outside longitudinal direction of the outer case covering 12, and the example of drawing 5 makes it jut out, and is cut down in the condition of having been grasped between the ctenidiums 17 which plants jutted out over the longitudinal direction on the occasion of horizontal migration of tree trimming equipment 1 as well as said example. Although opening is formed under the ctenidium member 14 in this example, since plants are grasped by the infeed 13 between ctenidiums 17, it becomes the wall which covers opening, and scattering of the dangerous substance by the rotary knife is prevented.

[0020] Although the ctenidium 17 of the example of drawing 3 , drawing 4 , and

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**DESCRIPTION OF DRAWINGS**

[Brief Description of the Drawings]

[Drawing 1] The drawing of longitudinal section showing the interior of the plants tree trimming equipment by the example of this invention

[Drawing 2] The perspective diagram of the plants tree trimming equipment in which the 1st example of this invention is shown

[Drawing 3] The perspective diagram of the plants tree trimming equipment by the 2nd example of this invention

[Drawing 4] The perspective diagram of the plants tree trimming equipment by the 3rd example of this invention

[Drawing 5] The perspective diagram of the plants tree trimming equipment by the 4th example of this invention

[Description of Notations]

- 1 -- Plants tree trimming equipment
- 2 -- Stay
- 3 -- Frame
- 4 -- Hydraulic motor
- 5 -- Axis of rotation
- 6 -- Rotation means of communication
- 7 -- Rotary knife unit
- 8 -- Support case
- 9 -- Brake mechanism
- 10 -- Edge
- 11 -- Shaft
- 12 -- Outer case covering
- 13 -- Infeed
- 14 -- Ctenidium member
- 15 -- Frame
- 16 -- Attachment edge
- 17 -- Ctenidium
- 18 -- Reinforcement plate
- 19 -- Reinforcing rib

[Serial Number] PAS99019

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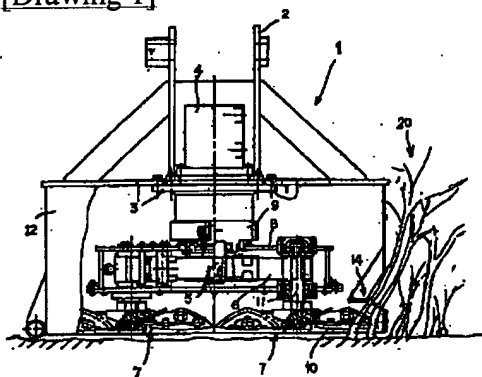
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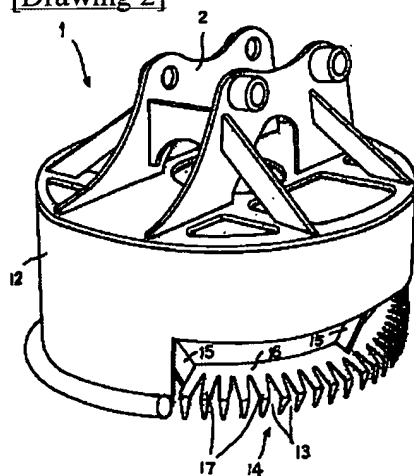
DRAWINGS

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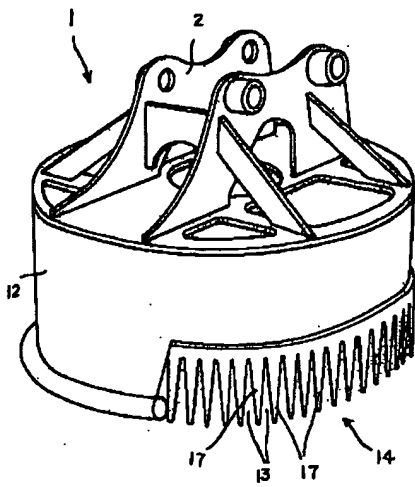
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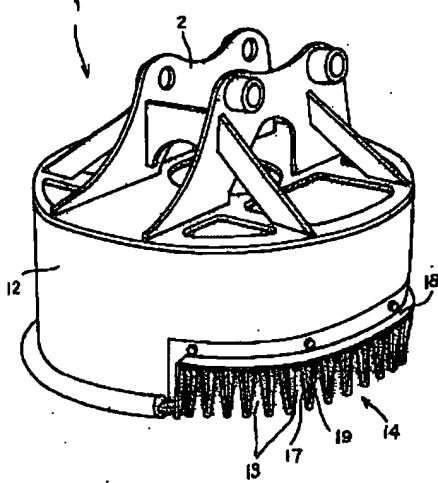
[Drawing 2]



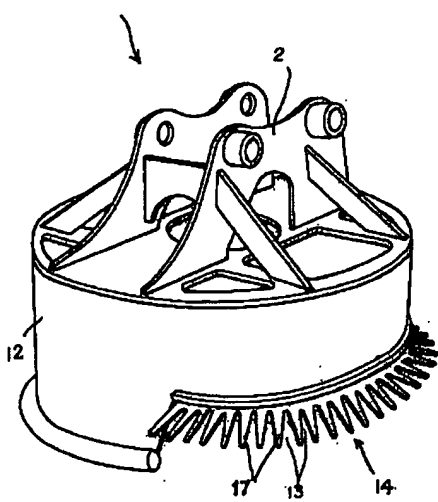
[Drawing 3]



[Drawing 4]



[Drawing 5]



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